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UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

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First Named Inventor or Application Identifier

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APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

ADDRESS TO:

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Box Patent Application
Washington, DC 20231

1. ☐ Fee Transmittal Form
(Submit an original, and a duplicate for fee processing)

2. ☒ Specification Total Pages **32**

3. ☒ Drawing(s) (35 USC 113) Total Sheets **12**

4. ☒ Oath or Declaration Total Pages **1**

a. ☐ Newly executed (original or copy)

b. ☒ Unexecuted for information purposes

c. ☐ Copy from a prior application (37 CFR 1.63(d))
(for continuation/divisional with Box 17 completed)

[Note Box 5 below]

i. ☐ **DELETION OF INVENTOR(S)**

Signed Statement attached deleting inventor(s)
named in the prior application, see 37 CFR
1.63(d)(2) and 1.33(b).

5. ☐ Incorporation By Reference (useable if Box 4c is checked)
The entire disclosure of the prior application, from which a copy of the
oath or declaration is supplied under Box 4c, is considered as being
part of the disclosure of the accompanying application and is hereby
incorporated by reference therein.

6. ☐ Microfiche Computer Program (Appendix)

7. Nucleotide and/or Amino Acid Sequence Submission
(if applicable, all necessary)

a. ☐ Computer Readable Copy

b. ☐ Paper Copy (identical to computer copy)

c. ☐ Statement verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

8. ☐ Assignment Papers (cover sheet & document(s))

9. ☐ 37 CFR 3.73(b) Statement ☐ Power of Attorney
(When there is an assignee)

10. ☐ English Translation Document (if applicable)

11. ☐ Information Disclosure
Statement (IDS/PTO-1449 ☐ Copies of IDS
Citations

12. ☐ Preliminary Amendment

13. ☒ Return Receipt Postcard (MPEP 503)
(Should be specifically itemized)

14. ☐ Small Entity ☐ Statement filed in prior application
Statement(s) Status still proper and desired

15. ☐ Certified Copy of Priority Document(s)
(if foreign priority is claimed)

16. ☐ Other: _____

17. If a CONTINUING APPLICATION, check appropriate box and supply the requisite information:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No. ____/____

18. CORRESPONDENCE ADDRESS

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CLAIMS	(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) CALCULATIONS
TOTAL CLAIMS (37 CFR 1.16(c))		19-20 =	-	X \$ 18.00 =	\$ -
INDEPENDENT CLAIMS (37 cfr 1.16(b))		4-3 =	1	X \$ 78.00 =	\$ 78.00
MULTIPLE DEPENDENT CLAIMS (if applicable) (37 CFR 1.16(d))				\$260.00 =	\$ -
				BASIC FEE (37 CFR 1.16(a))	\$760.00
Total of above Calculations =					\$838.00
Reduction by 50% for filing by small entity (Note 37 CFR 1.9, 1.27, 1.28).					-
TOTAL =					\$838.00

19. Small entity status

- a. ☐ A Small entity statement is enclosed
- b. ☐ A small entity statement was filed in the prior nonprovisional application and such status is still proper and desired.
- c. ☐ Is no longer claimed.

20. ☒ A check in the amount of \$ 838.00 to cover the filing fee is enclosed.

21. ☐ A check in the amount of \$ _____ to cover the recordal fee is enclosed.

22. The Commissioner is hereby authorized to credit overpayments or charge the following fees to Deposit Account No. 06-1205:

- a. ☒ Fees required under 37 CFR 1.16.
- b. ☐ Fees required under 37 CFR 1.17.
- c. ☐ Fees required under 37 CFR 1.18.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

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SIGNATURE	David L. Schaeffer
DATE	9/27/99

APPARATUS AND METHOD OF PROCESSING CHARACTERS

BACKGROUND OF THE INVENTION

Field of the Invention

5 The present invention relates to an apparatus and a method of processing characters by which characters are arranged in an area.

 The present invention relates to an apparatus and a method of processing characters by which a group of
10 characters are divided to be stored.

Related Background Art

 In recent years, with many character processing apparatuses, not only character data contained in a document can be processed, but also image data, e.g.
15 tables or graphics, contained therein can also be processed mixedly. The document processing apparatus of this sort is designed in such a way that before inputting the characters, the character line can be inputted to a specified rectangular area one character
20 by one character using a keyboard, the characters, for which the range is specified, of the inputted character group can be inputted by being moved or copied, or can be transferred to that area. In addition, some of those apparatuses can carry out the control in such a
25 way that the graphics or the like and the character data do not overlap each other.

 In addition, Windows (Microsoft) or the like have

come into wide use recently so that it has become possible that a plurality of documents are simultaneously edited when drawing up the documents, and also it has become possible by utilizing

5 simultaneously various applications that a plurality of works are carried out simultaneously and in parallel.

As a result, for the character data within the area in which a plurality of character data contained in the same document is to be arranged, and for the

10 character data contained in a plurality of documents, the copy and the movement have been able to be readily carried out.

However, when the movement, copy and transfer of the character line have become to be readily carried

15 out either between a plurality of documents or in the single document, a large amount of character data may be transferred to the small area, which has the less number of displayable character data, in edition of the document(s) by the maloperation which an editor does

20 not intend in some cases.

In addition, in the document processing apparatus in which the rectangular area, in which the character data is to be displayed, is previously specified, in

25 general, the format information such as the size of the specified area and the position of arrangement of the character data can be changed after having arranged once the characters. In this connection, even when all

of the character data is displayed in the area before changing the size of the area and the format attribute, by reducing the size of the area and by changing the attribute of the character size, there may occur the
5 case where the characters any of which can not be displayed, are generated within the area.

Then, if the character data which is left since it is more than the specified area can receive, is generated, then the character data which is left since
10 it is more than the specified area can receive, will not be displayed on the picture at all. In particular, when the characters are uniformly arranged within the area, since the character data which is left since it is more than the area can receive, is not displayed, an
15 operator can not visually judge whether or not the character data which has overflowed from the area is present, and hence such character data is left as it is in many cases.

Then, the character data which is left as it is,
20 while not displayed, present as the character data, which results in that the memory is unprepared wasted.

Further, even when an operator becomes aware of that the character data which is left since it is more than the specified area can receive, is present, an
25 operator needs to carry out the work of carrying out the document edition after having changed the size of the character arrangement area in such a way that all

of the character data which is left since it is more than the specified area can receive is displayed, and then restoring the size of the character arrangement area back to the original size. Therefore, the work of editing the character data is troublesome and complicated.

In addition, when the character data is read out from the text file to be successively transferred to be associated with the area, there is the case where however the area is increased, all of the character data can not be displayed since it is more than that area can receive. In such a case, the character data the amount of which is equal to or larger than the number of characters overflowing from the area needs to be deleted. In this connection, a part of the character line which is displayed within the area needs to be deleted and in addition thereto, a part of the overflow character line which becomes to be displayed as a result of that deletion needs to be deleted, and so forth. Therefore, an operator needs to carry out the very complicated work.

SUMMARY OF THE INVENTION

In the light of the foregoing, the present invention has been made in order to solve the above-mentioned problems associated with the prior art, and it is therefore an object of the present invention

to provide an apparatus and a method of processing a document by which the character data which can not be arranged in an area can be readily edited by reporting the fact that there is the character data which can not
5 be arranged in an area to an operator, and then by moving the character data which can not be arranged in an area to another area (or another position of the same area).

In addition, it is another object of the present
10 invention to enhance the operationability and the reliability in the edition of the characters which overflow so that they can not be outputted by carrying out the storage control or the output control with respect to the characters which overflow from the area
15 when they are left since they are more than the area which is specified in order to output the characters can receive.

BRIEF DESCRIPTION OF THE DRAWINGS

20 Fig. 1 is a block diagram showing a configuration of the overall apparatus according to an embodiment of the present invention;

Fig. 2 is a diagram showing an example of the information which is stored in order to manage a
25 character arrangement area;

Fig. 3 is a diagram showing the typesetting information which is used to calculate the arrangement

position of the character line which is arranged and displayed in and on a character editing apparatus shown in the embodiment;

Fig. 4 is a flow chart useful in explaining the line arrangement processing in an area in the embodiment;

Fig. 5 is a flow chart useful in explaining the processing of creating line information of the n-th line in the embodiment;

Fig. 6 is a flow chart useful in explaining the method of judging the overflow characters in the embodiment;

Figs. 7A, 7B and 7C are diagrams showing an example of the method of displaying the overflow characters in the embodiment;

Fig. 8 is a diagram showing a display example when no character overflows from an area, and the method of moving the overflow characters in the embodiment;

Fig. 9 is a diagram showing a display example of the overflow characters, and the method of moving the overflow characters in the embodiment;

Fig. 10 is a diagram showing the change in the stored information when moving the overflow characters in the embodiment;

Fig. 11 is a diagram showing the method of inserting the moved character data into another area in the embodiment; and

Fig. 12 is a diagram showing the change in the stored information when inserting the moved character data into another area in the embodiment.

5 DESCRIPTION OF THE PREFERRED EMBODIMENTS

The preferred embodiment of the present invention will hereinafter be described in detail with reference to the accompanying drawings.

Fig. 1 is a block diagram showing a configuration of an apparatus of processing characters according to an embodiment of the present invention.

The present apparatus includes: a display unit (CRT) 1; a video random access memory (VRAM) 2; a bit move unit (BMU) 3; a keyboard 4; a pointing device (PD) 5; a central processing unit (CPU) 6; a read only memory (ROM) 7; a RAM 8; a hard disc drive (HDD) 9; a floppy disc drive (FDD) 10; and a network interface (Net-I/F) 11. Those constituent elements are connected to one another through an input/output (I/O) bus 12 consisting of an address bus, a data bus and a control bus. In addition, the CRT 1 is connected to the VRAM 2.

The document in edition and the various message menus are displayed on the CRT 1. The VRAM 2 develops the characters and the image which are displayed on the CRT 1 and also stores therein them. The BMU 3 controls the transfer of the information between the constituent

elements. The keyboard 4 includes the various keys which an operator uses when editing the document. The PD 5 is used to point out the icon or the like which is displayed on the CRT 1.

5 In addition, the CPU 6 controls the constituent elements on the basis of the control program which is stored in the ROM 7 and also executes the processing of controlling the character line arrangement as will be described later. The ROM 7 stores therein the program
10 relating to the document edition, the error processing program and the program for processing the character line arrangement. The RAM 8 is used as the work area or shelter area in the error processing when the CPU 6 executes the various control programs as described
15 above.

In addition, each of the HDD 9 and the FDD 10 preserves therein the program relating to the character line arrangement processing as will be described later, the various information and libraries. Also, the
20 Net-I/F 11 carries out the control and the diagnosis of the network information in such a way that the present apparatus can carry out the transfer of the information between the present apparatus and other document processing apparatus through the network.

25 It is to be noted that the control program which is stored in the above-mentioned ROM 7 may also be stored in the storage medium such as a hard disc (HD),

a floppy disc (FD) or a removable disc (RD) (all not shown) which is specially connected to the present apparatus. Also, alternatively, the control program may be stored in the

5 storage medium which is additionally provided in another document processing apparatus or a computer which is connected to the present apparatus through the network.

Next, the description will hereinbelow be given
10 with respect to the information which is employed in the document editing processing in the present embodiment.

Fig. 2 is a diagram showing the information which is stored in order to manage the character arrangement area with which the present embodiment is realized.
15

Now, it is assumed that each of the information shown in Fig. 2 is stored in a character area data managing unit of the HDD 9 or the FDD10.

An area 2a is the area in which the number,
20 [num_areas], of character areas present in the document for which the edition is to be carried out, is stored; an area 2b is the area in which the information relating to the first character area of the character areas which are managed within the document, is stored;
25 and an area 2c is the area in which the information relating to the n-th character area thereof is stored. In the areas ranging from the area 2b to the area 2c,

as shown in Fig. 2, the area information of the number of the numeric value which is represented in the form of [num_area] is stored in the order of the area numbers in the character area data managing unit.

5 Then, the contents of the information relating to the individual character areas are written to the areas ranging from an area 2d to an area 2j.

10 The areas 2d and 2e are the areas in which the coordinate values as the references of the character areas are stored. In the present embodiment, each of the shapes of the character areas is rectangular and the coordinate values (pos_x, pos_y) at the vertex of the top left of the rectangular area are stored as the reference coordinates. In addition, the areas 2f and
15 2g are the areas in which the information relating to the shape and the size (height and width) of the character area is stored. In the present embodiment, since the character area has the rectangular shape, the height [area_height] and the width [area_width] of the
20 area are stored in the areas 2f and 2g, respectively. In addition, the area 2h is the area in which the format information [area_info] which the character data within the character area shown in the present
25 embodiment has is stored. The information relating to the format name, the format size, the line interval, the line pitch, the character interval and the like as the format information which is used to display the

characters within the area is stored in the area 2h.
The format information is inputted to be stored when a
new area is set by a user, or when the update is
carried out by a user.

5 In addition, an area 2i is the area in which the
information of the character data displayed in the
character area shown in the present embodiment is
stored, and the contents contained therein includes: in
addition to an area 2k in which the number,
10 [total_words], of character data, to be arranged in the
area is stored; an area 2l in which the first character
code to be arranged is stored; an area 2m in which the
second character code is stored; an are 2n in which the
n-th character code is stored, and the like.

15 In addition, the area 2j is the area which is used
in the typesetting which is used to calculate the
arrangement position of the character data which is to
be arranged and displayed in the present embodiment.
The details of the information stored in the area 2j is
20 shown in Fig. 3.

Fig. 3 shows the typesetting information which is
used to calculate the arrangement position of the
character line which is to be arranged and displayed in
the character processing apparatus shown in the present
25 embodiment.

Now, an area 3a is the area in which the number,
[num_lines], of lines which are arranged in the area is

stored; an area 3b is the area in which the line information of the first line is stored; and an area 3c is the area in which the line information of the n-th line is stored. In such a way, the line information for the number of lines which information is stored in the area 3a is stored, every line, in the areas 3b to 3c. Then, the detailed information which is contained in the respective line information is stored in areas 3d to 3g which will hereinbelow be in turn described.

10 The area 3d is the area in which the line number, [line_no], of the line of interest in the area having the line of interest contained therein is stored, and the area 3e is the area in which the baseline coordinate (baseline) of the line is stored. In the present embodiment, the baseline of the line corresponds to the position which is lower than the upper end, [pos_y], of the rectangular area by the character size information in the case of the first line of the area, and corresponds to the position which is lower than the baseline position of the line right before the first line, i.e., of the line the line number of which is smaller than that of the first line by one line by the line pitch in the case of not the first line. In the present embodiment, the character size information and the information of the line pitch and the like are stored as the format information in the area 2h.

In addition, an area 3f is the area in which the offset, [start_offset], which exhibits where the character code arranged in the head of the line of interest is ranked in the character data information (3i), is stored, and an area 3g is the area in which the number, [num_words], of character data which can be arranged within the line is stored. In the present embodiment, the offset is always 1 in the case of the first line within the area, and can be obtained by adding [num_words] to the offset of the line right before the first line in the case of not the first line.

Next, the method of controlling the character arrangement in the present embodiment will hereinbelow be described with reference to a flow chart.

Fig. 4 is a flow chart useful in explaining the line arrangement processing in the area in the present embodiment.

First of all, in Step S401, the work variable n which is used to count the number of lines is initialized to 1. Next, in Step S402, the line information of the n-th line in the area is created. The line information thus created is stored in the area 3c of the line information. The details of the created information is the information stored in the areas 3d to 3g shown in Fig. 3. While the details of the processing of creating the line information which is

executed in Step S402 will be specially described later with reference to a flow chart shown in Fig. 5, when the arrangement of the line can not be carried out in this processing, zero is set to the arrangement

5 judgement variable (ret) of the line (Step S509).

Then, in Step S403, it is judged whether or not the arrangement judgement variable (ret) of the line is zero.

10 Since if it is judged in Step S403 that $ret = 0$ is not established, then this means that the arrangement of the line has been carried out, n is incremented in Step S404 and then the processing is returned back to Step S402 in which the line information of the next line is created in turn.

15 On the other hand, since if it is judged in Step S403 that $ret = 0$ is established, no more line can be arranged in the area, in Step S405, in order to store the information relating to up to which line the arrangement has been completed, $(n - 1)$ is set to the
20 number, [num_lines], of lines in the area to complete the processing. The number, [num_lines], of lines in that area is stored in the area 3a.

The flow chart of Fig. 5 exhibits the processing of creating the line information of the n -th line in
25 the present embodiment.

First of all, in Step S501, the line number n of the line which will be created from now on is set in

the storage area 3d of the line number. This value n is the value which was set in Step S401 or S404. Next, in Step S502, it is judged whether or not $n = 1$ is established.

5 Since if it is judged in Step S502 that $n = 1$ is established, then the line information to be created is the line information of the first line within the area, in this case, in Step S505, the setting of the baseline position of the first line is carried out. The
10 baseline of the first line corresponds to the position which is lower than the upper end of the rectangular area by the character size of the character to be arranged. That is, the following relation is obtained.

$$\text{baseline} = \text{pos_y} * \text{character size to be arranged} \quad \dots (1)$$

15 In this connection, the character size of the character to be arranged is acquired from the format information which is stored in the area 2h. Then, in Step S506, 1 is set to the work variable (offset) exhibiting the
20 character position.

 On the other hand, since if it is judged in Step S502 that $n = 1$ is not established, the line information to be created is not the first line within the area, in this case, in Step S503, the baseline of
25 the line is set on the basis of the following expression:

$$\text{baseline} = \text{baseline} + \text{line pitch} \quad \dots (2)$$

In addition, the work variable offset exhibiting the character position is, from the first offset, [start_offset], of the line right before the first line and the number, [num_words], of character data in the line of the line right before the first line, obtained on the basis of the following expression:

$$\text{offset} = \text{start_offset} + \text{num_words} \quad \dots (3)$$

Next, in Step S507, it is judged whether or not the line can be arranged in the area. In this connection, that judgement is carried out on the basis of whether or not the baseline which has been calculated in Step S503 or Step S505 is above with respect to the lower end of the area, i.e., the judgement of whether or not the line of interest is contained within the area.

The lower end of the area corresponds to the position which is obtained by adding the height (height) of the rectangular area to the y coordinate value (pos_y) of the reference point. Therefore, since when the following relation is established;

$$\text{pos_y} + \text{height} < \text{baseline} \quad \dots (4)$$

it was judged that the line could not go into the area, thereby being determined that the line of interest can not be arranged.

If it is judged in Step S507 that the line of interest can not be arranged, in Step S509, zero is substituted for the arrangement judgement variable,

[ret], of the line to complete the processing.

On the other hand, if it is judged in Step S507 that the line of interest can be arranged, then in Step S508, 1 is substituted for the arrangement judgement variable, [ret], of the line of interest. Thereafter, in Step S510, the numeric value of [offset] is substituted for the first character data offset of the line of interest. Then, the first character data offset of the line of interest is stored in the area 3f.

Next, in Step S511, the work variable [length] exhibiting the length which is occupied by the character line arranged in the line is initialized with zero. Then, in Step S512, it is judged whether or not the width, [width], of the area exceeds the work variable [length].

If it is judged in Step S512 that the width, [width], of the area exceeds [length], then in Step S513, the [offset]-th character is arranged. At this time, the character width of the [offset]-th character data is added to [length]. In Step S514, the value of [offset] is incremented, and then in Step S515, it is judged whether or not there is the next character. If it is judged in Step S515 that there is no next character, then in Step S515, the following expression is judged to be established,

the number of character data < offset ... (5)

and hence in this case, in Step S516, the number of characters in the line is set and the processing completes. In this connection, the number, [num_words], of characters in the line can be obtained
5 on the basis of the following expression:

$$\text{num_words} = \text{offset} - \text{start_offset} - 1 \quad \dots (6)$$

and is stored in the area 3g.

On the other hand, if it is judged in Step S515 that there is the next character, then the processing
10 is returned back to the judgement in Step S512 to judge whether or not there is an area in which the character is to be arranged in the line.

In this connection, if it is judged in Step S512 that [length] exceeds the width, [width], of the area,
15 i.e., if the [offset]-th character is arranged in the line, then the character overflows in the line of interest, then in Step S516, the number of characters in the line is set to complete the processing. At this time, the number of characters in the line can be
20 obtained on the basis of the above expression (6).

In a manner as described above, the character arrangement in the present embodiment and the setting of the typesetting information resulting therefrom can be carried out.

25 Next, the description will hereinbelow be given with respect to the method of judging the overflow characters in the present embodiment with reference to

a flow chart shown in Fig. 6.

Fig. 6 is a flow chart useful in explaining the processing of judging whether or not there is the overflow characters in the present embodiment.

5 First of all, in Step S601, the line information of the final line (the lowest line) which is arranged in the area of interest is acquired on the basis of the typesetting information. The line information of the final line is stored in the area 3c of the line
10 information ($n = \text{num_lines}$) on the basis of the number, $[\text{num_lines}]$, of lines in the area 3a. Next, in Step S602, the final character data of the final line is obtained. The offset of the final character data of the final line can be obtained from the following
15 expression on the basis of the first character data offset, $[\text{start_offset}]$, of the final line which is stored in the area 3f, and the number, $[\text{num_words}]$, of the characters in the line of the final line which is stored in the area 3g.

20
$$\text{wCount} = \text{start_offset} + \text{num_words} - 1 \quad \dots (7)$$

Next, in Step S603, it is judged whether or not $[\text{wCount}]$ which has been obtained in Step S602 is equal to the total number, $[\text{total_words}]$, of character data in the area.

25 If it is judged in Step S603 that $[\text{wCount}]$ which has been obtained in Step S602 is not equal to the total number, $[\text{total_words}]$, of character data in the

area, this means that the character data to be arranged is still present after the final character which is arranged, i.e., there is the overflow characters. In this case, in Step S604, 1 is set to the arrangement judgement variable (ret).

On the other hand, if it is judged in Step S603 that [wCount] which has been obtained in Step S602 is equal to the total number, [total_words], of character data in the area, this means that up to the final character is arranged, and hence it is judged that there is no overflow character. In this case, in Step S605, zero is set to the variable (ret).

In a manner as described above, it is possible to judge whether or not there is the overflow characters when arranging the characters in the area. This processing is executed after completion of the line arrangement processing in the area in Fig. 4.

Figs. 7A to 7C are respectively diagrams showing picture examples when the area having the character overflow and the area having no character overflow are displayed on the CRT 1 of the apparatus according to the present embodiment.

Fig. 7A shows the displayed picture in the state in which there is no character overflow. In this case, the character line ("ABCDE") is arranged and displayed in the rectangular area.

Fig. 7B shows the displayed picture of the area in

which the overflow characters are present. In this case, while the character line ("ABCDEFGH IJKLMN OPQRST") is arranged and displayed in the rectangular area, only up to the character data "ABCDEFGH IJKLMN O" is displayed, and the character data "QRST" which is to be essentially arranged in this rectangular area is not displayed. In addition, the mark "+" exhibiting that there are the overflow characters is displayed in the bottom right of the rectangular area. Fig. 7C shows the state in which an operator carries out the edition manipulation of enlarging that area to change the size of that area so that all of the characters including the overflow characters are displayed.

Figs. 8 and 9 are respectively diagrams showing the picture examples each useful in explaining the manipulation method when moving the character line overflowing from the area.

First of all, in Fig. 8, there is shown the example in which the area (801) and the character line (802) are both displayed in the state in which there is no character overflow as shown in Fig. 7A. In this case, even when the pointer is moved within the rectangular area containing therein the characters and then the right-hand side button of the mouse is clicked to display a pop up menu (803) for that area, it is discriminated that no overflow character is present in that area on the basis of the judgement that the

variable (ret) of the area displayed in the cursor position when the mouse is clicked is read out so that zero is set to the variable (ret). Therefore, the sixth item from the top of the menu items, i.e.,

5 "Elimination of Overflow Character Line" is set as the unselectable function and this function is displayed which is different in form from any of other selectable functions as shown in Fig. 8 so as to be able to discriminate that effect.

10 On the other hand, in Fig. 9, there is shown the example in which the area from which the character overflow as shown in Fig. 7B is displayed. In this case, when the pointer is moved within the rectangular area containing therein the characters and then the
15 right-hand side button of the mouse is clicked to display the pop up menu for that area, on the basis of the judgement that 1 is set to the variable (ret) of that area, it is discriminated that the overflow characters are present in that area, and also the sixth
20 item from the top of the menu items, i.e., "Elimination of Overflow Character Line" is set as the selectable function. If this item is selected, in actual, the elimination of the overflow character line "PQRST" is executed so that the overflow characters "PQRST" will
25 be moved to another area. When being intended to move the character line, the character data ranging from the character data next to the final character data of the

final line which was obtained in Step S602 up to the final character data which is stored in the character data information 2i of that area is read out to be moved.

5 Fig. 10 is a diagram showing the change in the data stored in the RAM 8 when moving the character line overflowing from the area in the present embodiment.

By executing the elimination from the information before executing the elimination, the character data
10 "PQRST" which was not displayed in the area is moved to a new storage area (refer to a part (C) of Fig. 10). The character line "PQRST" thus moved can be inserted into an arbitrary position within the character data which is set in an arbitrary character area.
15 Alternatively, after having enlarged the size of the original area from which the character line has been moved, the character line "PQRST" can also be reinserted into the original positions.

Fig. 11 is a diagram showing an example when the
20 moved character data is inserted into another character data area in the present embodiment. At the time when the pointer is moved to the area on the CRT 1 in which the character line "12345" is displayed, and then the character cursor is made indicate the position between
25 "2" and "3" of the character line "12345" to click the right-hand side button of the mouse, the pop up menu is displayed. Then, the fifth item "Paste" of the menu

items is selected, whereby the moved character line
"PQRST" which has been cut can be inserted into the
position of the character cursor which has been
indicated. At this time, as shown in Fig. 12, the
5 character data within the stored data is changed from
"12345" to "12PQRST345".

In the case where the range of the character line
within the character area is specified, the character
line which has not been inserted, but has been moved
10 may be replaced with the character line the range of
which has been specified.

In is to be noted that if the manipulation shown
in Fig. 11 is not carried out at all, then the
character data overflowing from the area is left
15 deleted from the document. Then, if the power source
is turned OFF, the overflow character data which is
stored in the RAM 8 until then will be erased. It is
to be understood that before turning OFF the power
source, the overflow character may be stored from the
20 RAM 8 to the HDD 9 or to the FDD 10 to be retained
therein.

By executing the above-mentioned processings,
carrying out the judgement and the movement processing
for the character data overflowing from the area
25 becomes possible.

As set forth hereinabove, according to the present
invention, an operator can visually judge whether or

not there is characters which are not arranged in an arbitrary character area in the document to overflow therefrom, and also can delete the character line of interest or can move it to another area by the simple
5 operation. As a result, there is obtained the effect that an operator can edit the character line overflowing from the area by the simple operation without wasting carelessly the document memory.

While the present invention has been particularly
10 shown and described with reference to the preferred embodiment and the specified modifications thereof, it will be understood that the various changes and other modifications will occur to those skilled in the art without departing from the scope and true spirit of the
15 invention. The scope of the invention is therefore to be determined solely by the appended claims.

WHAT IS CLAIMED IS:

1. A character processing apparatus comprising:
a first storage means for storing therein
information relating to an area;

5 a second storage means for storing therein
character data in association with an area from which
the character data is to be outputted;

arrangement means for arranging the character data
stored in said second storage means in an area which is
10 created in accordance with the information stored in
said first storage means;

judgement means for judging whether or not, when
the character data is arranged by said arrangement
means, there is character data which can not be
15 arranged; and

control means for carrying out the control in such
a way that said non-arranged character data is stored
in third storage means different from said second
storage means.

20

2. A character processing apparatus according to
claim 1, wherein when displaying the area for which it
is judged by said judgement means that there is said
non-arranged character data, a mark is displayed
25 together therewith which reports that there is the non-
arranged character data.

3. A character processing apparatus according to claim 1, wherein the character data which has been stored in said third storage means is arranged in an area different from the area which is created in accordance with the information stored in said first storage means.

4. A character processing apparatus according to claim 1, wherein the character data stored in said third storage means is arranged in the position which is specified by a cursor.

5. A character processing apparatus according to claim 1, wherein the character data which has been arranged and frame data representing an area are both displayed.

6. A character processing apparatus according to claim 1, wherein said arrangement means arranges the character data in accordance with the format which is decided for every area.

7. A character processing method of storing therein information relating to an area in a first step, and of storing therein character data in a second step in association with an area from which the character data is to be outputted, comprising the steps

of:

arranging the character data stored in said second storage step in an area which is created in accordance with the information stored in said first storage step;

5 judging whether or not, when the character data is arranged, there is character data which can not be arranged; and

10 carrying out the control in such a way that said non-arranged character data is stored in a third storage step different from said second storage step.

8. A character processing method according to claim 7, wherein when displaying the area for which it is judged that there is said non-arranged character data, a mark is displayed together therewith which reports that there is the non-arranged character data.

9. A character processing method according to claim 7, wherein the character data which has been stored in said third storage step is arranged in an area different from the area which is created in accordance with the information stored in said first storage step.

25 10. A character processing method according to claim 7, wherein the character data stored in said third storage step is arranged in the position which is

specified by a cursor.

11. A character processing method according to
claim 7, wherein the character data which has been
5 arranged and frame data representing an area are both
displayed.

12. A character processing method according to
claim 7, wherein with respect to the arrangement of the
10 character data, the character data is arranged in
accordance with the format which has been decided every
area.

13. A character processing method, comprising the
15 steps of:

arranging character data, which is stored in
storage step in association with an area from which the
character data is to be outputted, in the associated
area;

20 judging whether or not there is character data
which can not be arranged in the area; and

carrying out the control in such a way that said
non-arranged character data is read out in the storage
step to be stored in another storage step.

25

14. A storage medium from which the data can be
read out by a computer, said storage medium storing

therein:

a control program for arranging character data,
which is stored in storage means in association with an
area from which the character data is to be outputted,
5 in the associated area;

a control program for judging whether or not there
is character data which can not be arranged in the
area; and

a control program for carrying out the control in
10 such a way that said non-arranged character data is
read out from said storage means to be stored in
another storage means.

15 15. A storage medium according to claim 14,
further storing therein a control program for
displaying, when displaying the area for which it is
judged that there is said non-arranged character data,
a mark together therewith which reports that there is
the non-arranged character data.

20

16. A storage medium according to claim 14,
further storing therein a control program for arranging
character data which has been stored in said another
storage means in an area different from the area which
25 is created in accordance with the information stored in
said storage means.

17. A storage medium according to claim 14,
further storing therein a control program for arranging
character data which has been stored in said another
storage means in a position which is specified by a
5 cursor.

18. A storage medium according to claim 14,
further storing therein a control program for
displaying both of character data which has been
10 arranged and frame data representing an area.

19. A storage medium according to claim 14,
further storing therein a control program for arranging
the character data in accordance with the format which
15 is decided every area.

ABSTRACT OF THE DISCLOSURE

An object of the present invention is, when transferring a group of character data to an area, if there are the characters which are left since they are more than the area can receive due to the size of the area or the format, to prevent those characters from being left not arranged and to simplify the manipulation therefor. In order to attain the above object, when arranging the character data in the area which is specified in order to output the character data therefrom, any of the characters which are left since they are more than the area can receive is extracted to be stored in another area, whereby it is made possible to display only those characters in another area, an area having an empty display area contained therein, or the like. In addition, it is made possible to discriminate, every area, that there are such overflow characters.

FIG. 1

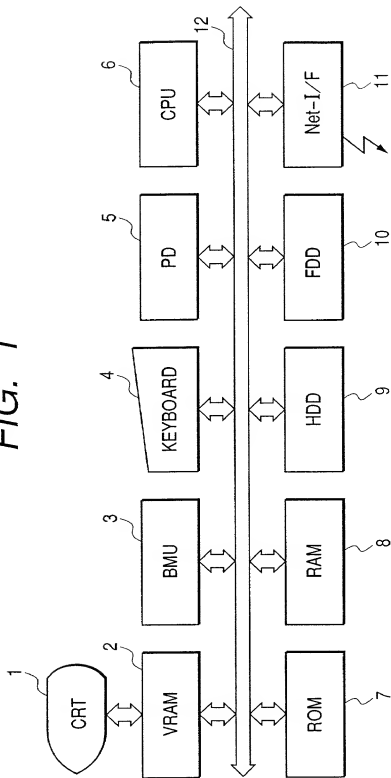


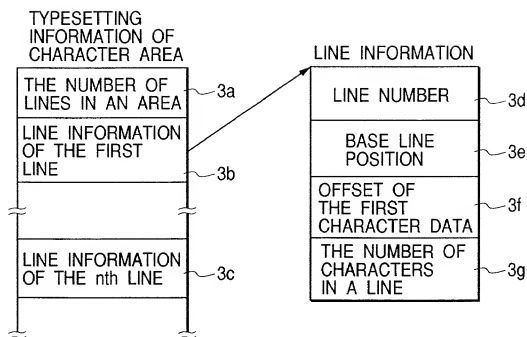
FIG. 3

FIG. 4

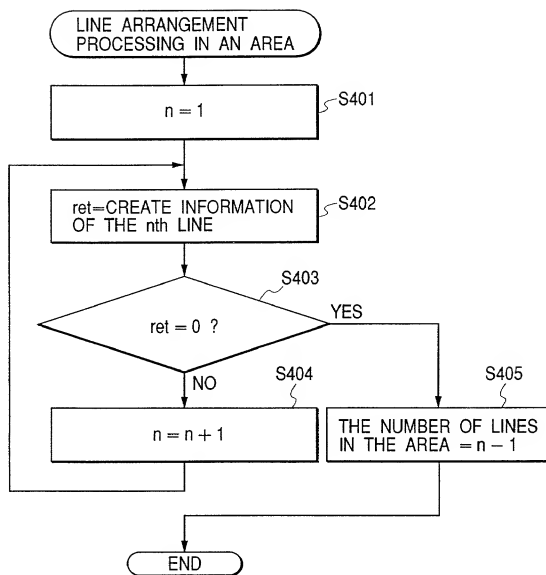


FIG. 5

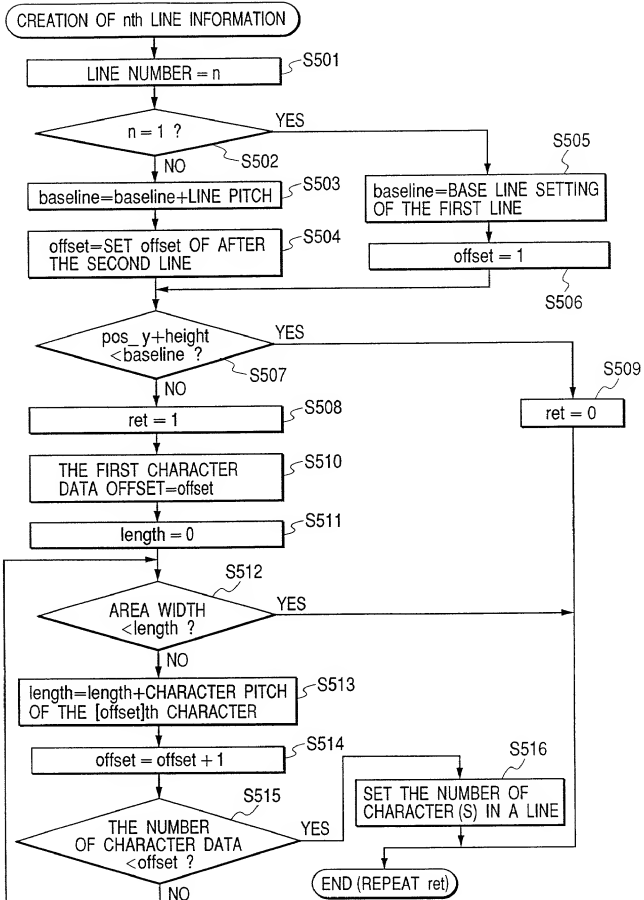


FIG. 6

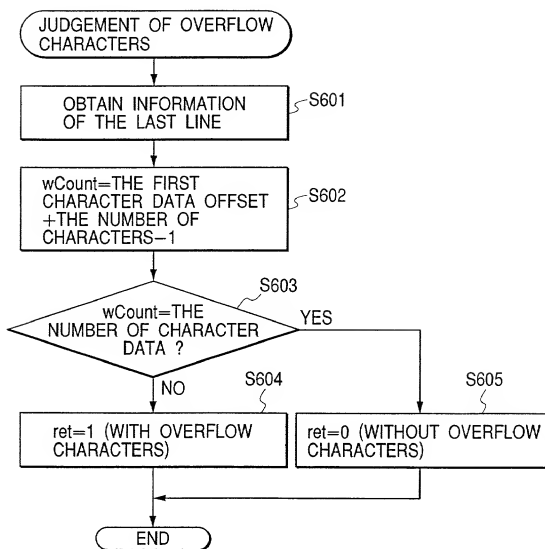


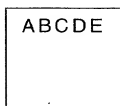
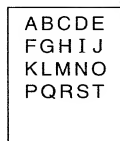
FIG. 7A*FIG. 7B**FIG. 7C*

FIG. 8

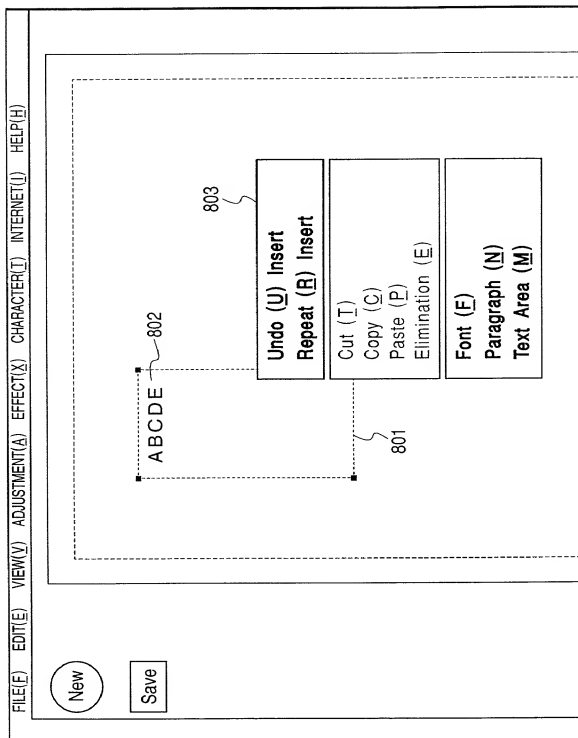


FIG. 9

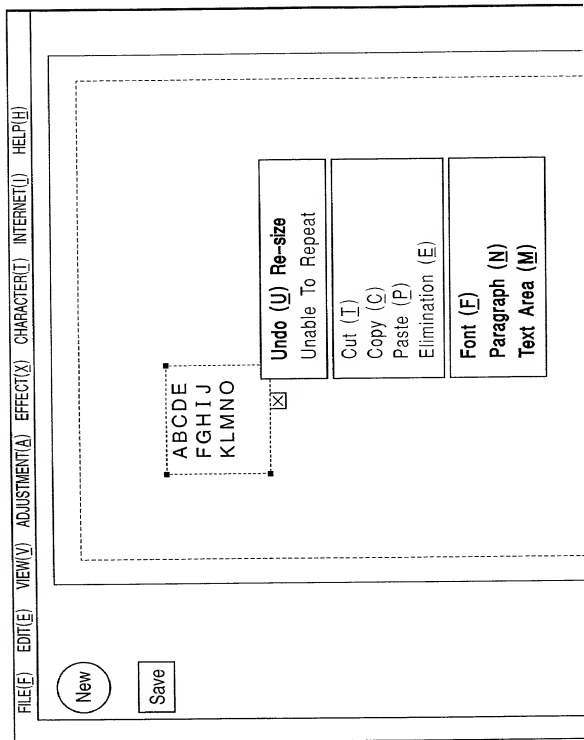


FIG. 10

(A) CHARACTER DATA
INFORMATION
(BEFORE CUT)

THE NUMBER OF CHARACTER DATA (20)
CHARACTER CODE "A"
CHARACTER CODE "B"
CHARACTER CODE "C"
CHARACTER CODE "D"
CHARACTER CODE "E"
CHARACTER CODE "F"
CHARACTER CODE "G"
CHARACTER CODE "H"
CHARACTER CODE "I"
CHARACTER CODE "J"
CHARACTER CODE "K"
CHARACTER CODE "L"
CHARACTER CODE "M"
CHARACTER CODE "N"
CHARACTER CODE "O"
CHARACTER CODE "P"
CHARACTER CODE "Q"
CHARACTER CODE "R"
CHARACTER CODE "S"
CHARACTER CODE "T"

(B) CHARACTER DATA
INFORMATION
(AFTER CUT)

THE NUMBER OF CHARACTER DATA (15)
CHARACTER CODE "A"
CHARACTER CODE "B"
CHARACTER CODE "C"
CHARACTER CODE "D"
CHARACTER CODE "E"
CHARACTER CODE "F"
CHARACTER CODE "G"
CHARACTER CODE "H"
CHARACTER CODE "I"
CHARACTER CODE "J"
CHARACTER CODE "K"
CHARACTER CODE "L"
CHARACTER CODE "M"
CHARACTER CODE "N"
CHARACTER CODE "O"

(C) MOVED CHARACTER
INFORMATION

THE NUMBER OF CHARACTER DATA (5)
CHARACTER CODE "P"
CHARACTER CODE "Q"
CHARACTER CODE "R"
CHARACTER CODE "S"
CHARACTER CODE "T"

FIG. 11

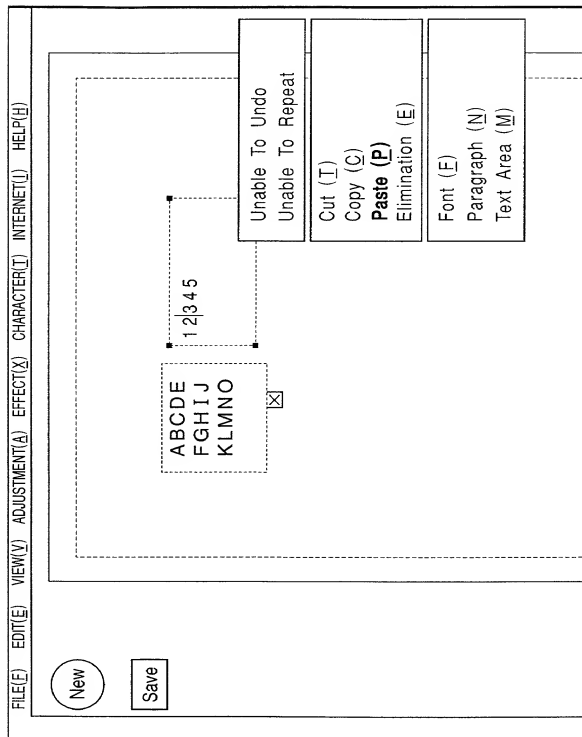


FIG. 12

(A) TEXT DATA
INFORMATION
(BEFORE PASTE)

THE NUMBER OF TEXT DATA (5)
TEXT CODE "1"
TEXT CODE "2"
TEXT CODE "3"
TEXT CODE "4"
TEXT CODE "5"

(C) MOVED TEXT
INFORMATION

THE NUMBER OF TEXT DATA (5)
TEXT CODE "P"
TEXT CODE "Q"
TEXT CODE "R"
TEXT CODE "S"
TEXT CODE "T"

(B) TEXT DATA
INFORMATION
(AFTER PASTE)

THE NUMBER OF TEXT DATA (10)
TEXT CODE "1"
TEXT CODE "2"
TEXT CODE "P"
TEXT CODE "Q"
TEXT CODE "R"
TEXT CODE "S"
TEXT CODE "T"
TEXT CODE "3"
TEXT CODE "4"
TEXT CODE "5"

**COMBINED DECLARATION AND POWER OF ATTORNEY
FOR PATENT APPLICATION**
(Page 1)

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled APPARATUS AND METHOD OF PROCESSING CHARACTERS, the specification of which ☒ is attached hereto ☐ was filed on _____ as United States Application No. or PCT International Application No. _____ and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR §1.56.

I hereby claim foreign priority benefits under 35 U.S.C. §119(a)-(d) or §365(b), of any foreign application(s) for patent or inventor's certificate, or §365(a) of any PCT international application which designates at least one country other than the United States, listed below and have also identified below any foreign application for patent or inventor's certificate, or PCT international application having a filing date before that of the application on which priority is claimed:

Country	Application No.	Filed (Day/Mo./Yr.)	(Yes/No) Priority Claimed
Japan	10-275233	29 September 1998	Yes

I hereby claim the benefit under 35 U.S.C. § 120 of any United States application(s), or § 365(c) of any PCT international application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 C.F.R. § 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

Application No.	Filed (Day/Mo./Yr.)	Status (Patented, Pending, Abandoned)
	NONE	

I hereby appoint the practitioners associated with the firm and Customer Number provided below to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith, and direct that all correspondence be addressed to the address associated with that Customer Number:

FITZPATRICK, CELLA, HARPER & SCINTO
Customer Number: 05514

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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